

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Kio Y. Ahn et al.

Title: METHODS FOR MAKING INTEGRATED-CIRCUIT WIRING FROM COPPER, SILVER, GOLD, AND OTHER METALS

Docket No.: 303.648US1

Filed: January 18, 2000

Examiner: Neal Berezny

Serial No.: 09/484303

Due Date: June 30, 2003

Group Art Unit: 2823

Commissioner for Patents  
P.O.Box 1450  
Alexandria, VA 22313-1450



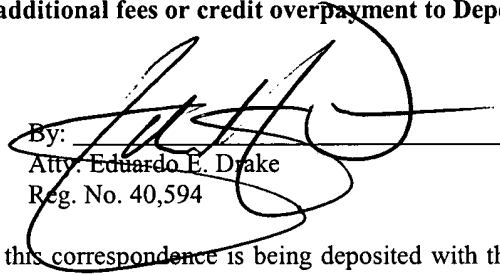
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We are transmitting herewith the following attached items (as indicated with an "X"):

- ☒ A return postcard.
- ☒ A Response under 37 CFR 1.111 (2 Pages).
- ☒ A Supplemental Information Disclosure Statement (1 pg.), Form 1449 (3 pgs.), and copies of 68 cited documents.
- ☒ A check in the amount of \$180.00 to cover the fee for consideration of Supplemental Information Disclosure Statement under 97(c).

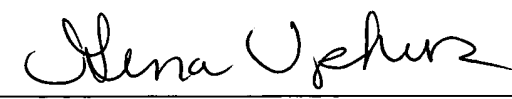
If not provided for in a separate paper filed herewith, Please consider this a PETITION FOR EXTENSION OF TIME for sufficient number of months to enter these papers and please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.  
P.O. Box 2938, Minneapolis, MN 55402 (612-373-6900)

By:   
Atty. Eduardo E. Drake  
Reg. No. 40,594

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Name Gina M. Uphus

  
Signature

Customer Number 21186

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.

P.O. Box 2938, Minneapolis, MN 55402 (612-373-6900)

(GENERAL)

S/N 09/484303

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Kie Y. Ahn et al.

Examiner: Neal Berezny

Serial No.: 09/484303

Group Art Unit: 2823

Filed: January 18, 2000

Docket No.: 303.648US1

Title: METHODS FOR MAKING INTEGRATED-CIRCUIT WIRING FROM  
COPPER, SILVER, GOLD, AND OTHER METALS

RESPONSE UNDER 37 CFR § 1.111

Commissioner for Patents  
P.O.Box 1450  
Alexandria, VA 22313-1450

**Interview Summary**

In response to the Office Action mailed on March 31, 2003, applicant's patent counsel Eduardo Drake interviewed Ex. Berezney on June 27, 2003. The focus of the interview was the fact that the Office Action did not reflect applicant's earlier facsimile filing of a Preliminary Amendment on March 12, 2003. Agreement was reached that a new, superceding non-final Office Action reflecting the Preliminary Amendment would be prepared and mailed in due course.

Applicant further notes that a Supplemental Information Disclosure Statement accompanies this paper, and requests respectfully that the Examiner consider the associated references in preparation of the new, non-final Office Action.

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**CONCLUSION**

The Examiner is invited to telephone Applicant's attorney at (612) 349-9593 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743

Respectfully submitted,

KIE Y. AHN ET AL.

By their Representatives,

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.  
P.O. Box 2938  
Minneapolis, MN 55402  
612-349-9593

Date

30 Jun 2003

By

Eduardo E. Drake

Reg. No. 40,594

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Name

Gina M. Uphus

Signature

Gina M. Uphus

S/N 09/484303

**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant: Kie Y. Ahn et al.

Examiner: Neal Berezny

Serial No.: 09/484303

Group Art Unit: 2823

Filed: January 18, 2000

Docket: 303.648US

Title: METHODS FOR MAKING INTEGRATED-CIRCUIT WIRING FROM COPPER,  
SILVER, GOLD, AND OTHER METALS

**SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

Assistant Commissioner for Patents  
P.O.Box 1450  
Alexandria, VA 22313-1450

In compliance with the duty imposed by 37 C.F.R. § 1.56, and in accordance with 37 C.F.R. §§ 1.97 *et. seq.*, the enclosed materials are brought to the attention of the Examiner for consideration in connection with the above-identified patent application. Applicants respectfully request that this Supplemental Information Disclosure Statement be entered and the documents listed on the attached Form 1449 be considered by the Examiner and made of record. Pursuant to the provisions of MPEP 609, Applicants request that a copy of the 1449 form, initialed as being considered by the Examiner, be returned to the Applicants with the next official communication.

Pursuant to 37 C.F.R. §1.97(c)(2), Applicants have included the fee of \$180.00 as set forth in 37 C.F.R. §1.17(p). Please charge any additional fees or credit any overpayment to Deposit Account No. 19-0743.

The Examiner is invited to contact the Applicants' Representative at the below-listed telephone number if there are any questions regarding this communication.

Respectfully submitted,

KIE Y. AHN ET AL.

By their Representatives,

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.  
P.O. Box 2938  
Minneapolis, MN 55402  
612-349-9593

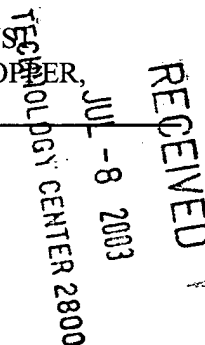
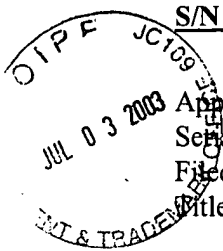
Date 30 June 2003

By [Signature]  
Eduardo E. Drake  
Reg. No. 40,594

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Name Gina M. Uphus

Signature [Signature]

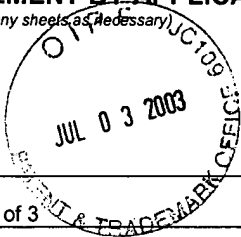


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**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

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Sheet 1 of 3

Complete if Known

<b>Application Number</b>	09/484303
<b>Filing Date</b>	January 18, 2000
<b>First Named Inventor</b>	Ahn, Kie
<b>Group Art Unit</b>	2823
<b>Examiner Name</b>	Berezny, Neal

Attorney Docket No: 303.648US1

**US PATENT DOCUMENTS**

Examiner Initial *	USP Document Number	Publication Date	Name of Patentee or Applicant of cited Document	Class	Subclass	Filing Date If Appropriate
	US-01/0002333	05/31/2001	Huang, Chao-Yuan , et al.	438	637	03/29/1999
	US-2002/0014646	02/07/2002	Tsu, , et al.	257	296	
	US-2002/0028552	03/07/2002	Lee, , et al.	438	243	
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	US-5,814,557	09/29/1998	Venkatraman, Ramnath , et al.	438	622	05/20/1996
	US-5,821,168	10/13/1998	Jain, Ajay	438	692	07/16/1997
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	US-5,907,772	05/25/1999	Iwasaki, Haruo	438	253	02/26/1997
	US-5,925,930	07/20/1999	Farnworth, Warren M., et al.	257	737	05/21/1996
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	US-5,972,179	10/26/1999	Chittipeddi, , et al.	204	192.17	09/30/1997
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	US-6,091,136	07/18/2000	Jiang, T. , et al.	257	676	11/17/1998

**EXAMINER**

**DATE CONSIDERED**

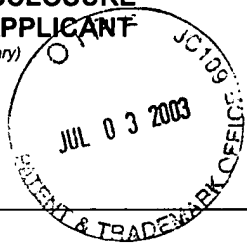
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**INFORMATION DISCLOSURE  
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Complete if Known

<b>Application Number</b>	09/484303
<b>Filing Date</b>	January 18, 2000
<b>First Named Inventor</b>	Ahn, Kie
<b>Group Art Unit</b>	2823
<b>Examiner Name</b>	Berezny, Neal

Sheet 2 of 3

Attorney Docket No: 303.648US1

	US-6,100,193	08/01/2000	Suehiro, , et al.	438	685	
	US-6,126,989	10/03/2000	Robinson, Karl , et al.	427	97	08/26/1998
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	US-6,399,489	06/04/2002	M'Saad, H. , et al.	438	680	11/01/1999
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	US-6,429,120	08/06/2002	Ahn, Kie Y., et al.	438	635	01/18/2000
	US-6,518,198	02/11/2003	Klein, Rita J.	438	758	08/31/2000

**FOREIGN PATENT DOCUMENTS**

Examiner Initials*	Foreign Document No	Publication Date	Name of Patentee or Applicant of cited Document	Class	Subclass	T <sup>2</sup>
	JP-07-321111	08/12/1995	Tetsuo, K.	H01L	21/320 5	

**OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS****EXAMINER****DATE CONSIDERED**

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<b>Group Art Unit</b>	2823
<b>Examiner Name</b>	Berezny, Neal

Sheet 3 of 3

Attorney Docket No: 303.648US1

Examiner Initials*	Cite No <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
		EISENBRAUN, E. T., et al., "Selective and Blanket Low-Temperature Copper CVD for Multilevel Metallization in ULSI", <u>Conference Proceedings ULSI-VII</u> , (1992),5 pages	
		FUKUDA, T. , et al., "0.5 -micrometer-Pitch Copper-Dual-Damascene Metallization Using Organic SOG (k=2.9) for 0.18-micrometer CMOS Applications", <u>IEEE</u> , (1999),pp. 619-622	
		HIRAO, S. , et al., "A Novel Copper Reflow Process Using Dual Wetting Layers", <u>Symposium on VLSI Technology, Digest of Technical Papers</u> ,(1997),57-58	
		KALOYEROS, A. E., et al., "Blanket and Selective Copper CVD from Cu(FOD)2 for Multilvel Metallization", <u>Mat. Res. Soc. Symp. Proc.</u> , Vol. 181,(1990),6 pages	
		KLAUS, J. W., "Atomic Layer Deposition of Tungsten Nitride Films Using Sequential Surface Reactions", <u>Journal of the Electrochemical Society</u> , 147(3),(2000),pp. 1175-1181	
		MIN, JAE-SIK , et al., "Metal-Organic Atomic-Layer Deposition of Titanium-Silicon-Nitride Films", <u>Applied Physics Letters</u> , Volume 75, No. 11,(1999),pp. 1521-1523	
		MIN, J. , et al., "Metal-organic atomic-layer deposition of titanium-silicon-nitride films", <u>Applied Physics Letters</u> , 75(11), (1999),pp .1521-1523	
		VENKATESAN, S. , "A High Performance 1.8V, 0.20 micrometer CMOS Technology with Copper Metallization", <u>IEEE</u> , (1997),pp. 769-772	

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